Joint Service Small Arms Program (JSSAP)
Office of the Secretary of Defense (OSD)
20.2 Small Business Innovation Research (SBIR)
Direct to Phase II
Proposal Submission Instructions

IMPORTANT

Deadline for Receipt: Proposals must be **completely** submitted no later than **12:00 p.m.** ET, July 2, 2020. Proposals submitted after 12:00 p.m. will not be evaluated.

Proposers must follow all instructions as provided in the DoD SBIR 20.2 BAA Instructions at https://www.dodsbirsttr.mil/submissions, EXCEPT for the specific deviations listed below.

Help Desk: If you have questions about the Defense Department's SBIR or STTR Programs, please call the DoD SBIR/STTR Help Desk email DoDSBIRSupport@reisystems.com.

INTRODUCTION

The Joint Service Small Arms Program (JSSAP)is participating under the OSD SBIR Program on this SBIR 20.2 Broad Agency Announcement (BAA).

Proposers responding to the JSSAP topic listed in this Announcement must follow all instructions provided in the DoD SBIR 20.2 Broad Agency Announcement (BAA) posted on the DoD SBIR/STTR website at: https://www.dodsbirsttr.mil/submissions.

Firms with strong research and development capabilities in science or engineering in any of the topic areas described in this section, and with the ability to commercialize the results, are encouraged to participate. The OSD SBIR Program will support high quality research and development proposals of innovative concepts to solve the listed defense-related scientific or engineering problems, especially those concepts that also have high potential for commercialization in the private sector.

Objectives of the OSD SBIR Program include stimulating technological innovation, strengthening the role of small business in meeting DOD research and development needs, fostering and encouraging participation by minority and disadvantaged persons in technological innovation, and increasing the commercial application of DOD-supported research and development results. The guidelines presented in the announcement incorporate and exploit the flexibility of the SBA Policy Directive to encourage proposals based on scientific and technical approaches most likely to yield results important to DoD and the private sector.

CHART 1: Consolidated SBIR Topic Information

Applicable Topics	Direct to Phase II			
	Technical Volume (Vol 2)	Additional Info (Vol 5)	Award Amount	Technical Duration
OSD202-D001	Not to exceed 30 pages	N/A	Base Period: $1,000,000 Option Period: $500,000 **Not to exceed total award amount: $1,500,000**	Base Period: 12 months Option Period: 6 months **Total Duration: 18 months**

DIRECT TO PHASE II

15 U.S.C. §638 (cc), as amended by NDAA FY2012, Sec. 5106, and further amended by NDAA FY2019, Sec. 854, PILOT TO ALLOW PHASE FLEXIBILITY, allows the Department of Defense to make an award to a small business concern under Phase II of the SBIR program with respect to a project, without regard to whether the small business concern was provided an award under Phase I of an SBIR program with respect to such project. OSD is conducting a Direct to Phase II (DP2) implementation of this authority for this 20.2 SBIR Announcement and does not guarantee DP2 opportunities will be offered in future Announcements.

Proposers interested in submitting a DP2 proposal in response to an eligible topic must provide documentation to substantiate that the scientific and technical merit and feasibility described in the Phase I section of the topic has been met and describes the potential commercial applications. Documentation should include all relevant information including, but not limited to: technical reports, test data, prototype designs/models, and performance goals/results. Work submitted within the feasibility documentation must have been substantially performed by the proposer and/or the PI.

OSD will not evaluate the proposer's related Phase II proposal if it determines that the proposer has failed to demonstrate that technical merit and feasibility has been established or the proposer has failed to demonstrate that work submitted in the feasibility documentation was substantially performed by the proposer and/or the PI.

Feasibility documentation cannot be based upon any prior or ongoing federally funded SBIR or STTR work and DP2 proposals MUST NOT logically extend from any prior or ongoing federally funded SBIR or STTR work.

The OSD SBIR Program reserves the right to not make any awards under this DP2 announcement. The Government is not responsible for expenditures by the offeror prior to award of a contract. All awards are subject to availability of funds and successful negotiations.

PROPOSAL SUBMISSION

Proposers are REQUIRED to submit UNCLASSIFIED proposals via the Defense SBIR/STTR Innovation Portal (DSIP) at https://www.dodsbirsttr.mil/submissions/. Firms submitting through this site for the first time will be asked to register. It is recommended that firms register as soon as possible upon identification of a proposal opportunity to avoid delays in the proposal submission process. Submission deadlines are strictly enforced. Proposals submitted by any other means will be disregarded.

Full proposal packages must be submitted by 12:00 PM EST on July 2, 2020.

DIRECT TO PHASE II PROPOSAL PREPARATION INSTRUCTIONS AND PROPOSAL REQUIREMENTS

The Technical Volume is limited to 30 pages, which includes 10 pages for the feasibility documentation and 20 pages for the Phase II Technical Proposal. The Cover Sheet, Cost Volume and Commercialization Report do not count toward the 30-page limitation. The Government will not consider pages in excess of the page count limitations.

Phase II proposals require a comprehensive, detailed submission of the proposed effort. OSD Direct to Phase II efforts are awarded up to a maximum value of the dollar amounts and duration listed in Chart 1.

A. Proposal Cover Sheet (Volume 1): Complete as specified in DoD SBIR/STTR BAA section 5.

B. Format of Technical Volume (Volume 2):

- The Technical Volume must include two parts, PART ONE: Feasibility Documentation and PART TWO: Technical Proposal.
- Type of file: The Technical Volume must be a single Portable Document Format (PDF) file, including graphics. Perform a virus check before uploading the Technical Volume file. If a virus is detected, it may cause rejection of the proposal. Do not lock or encrypt the uploaded file. Do not include or embed active graphics such as videos, moving pictures, or other similar media in the document.
- Layout: Number all pages of your proposal consecutively. Font size should not be smaller than 10-point on standard 8-1/2" x 11" paper with one-inch margins. The header on each page of the Technical Volume should contain your company name, topic number, and proposal number assigned by DSIP when the Cover Sheet was created. The header may be included in the one-inch margin.

C. Content of the Technical Volume (Volume 2)

PART ONE: Feasibility Documentation

- Provide documentation to substantiate that the scientific and technical merit and feasibility described in the Phase I section of the topic has been met and describes the potential commercial applications. Documentation should include all relevant information including, but not limited to: technical reports, test data, prototype designs/models, and performance goals/results.
- Maximum page length for feasibility documentation is 10 pages. If you have references, include a reference list or works cited list as the last page of the feasibility documentation. This will count towards the page limit.

- Work submitted within the feasibility documentation must have been substantially performed by the proposer and/or the PI.
- If technology in the feasibility documentation is subject to Intellectual Property (IP), the proposer must either own the IP, or must have obtained license rights to such technology prior to proposal submission, to enable it and its subcontractors to legally carry out the proposed work. Documentation of IP ownership or license rights shall be included in the Technical Volume of the proposal
- DO NOT INCLUDE marketing material. Marketing material will NOT be evaluated.

PART TWO: Technical Proposal

Maximum page length for the technical proposal is 20 pages. If you have references, include a reference list or works cited list as the last page of the technical proposal. This will count towards the page limit.

(1) Significance of the Problem. Define the specific technical problem or opportunity addressed and its importance.

(2) Phase II Technical Objectives. Enumerate the specific objectives of the Phase II work and describe the technical approach and methods to be used in meeting these objectives.

(3) Phase II Statement of Work. The statement of work should provide an explicit, detailed description of the Phase II approach, indicate what is planned, how and where the work will be carried out, a schedule of major events and the final product to be delivered. The methods planned to achieve each objective or task should be discussed explicitly and in detail. This section should be a substantial portion of the total proposal.

   a) Phase II Option Statement of Work The statement of work should provide an explicit, detailed description of the activities planned during the Phase II Option, if exercised. Include how and where the work will be carried out, a schedule of major events and the final product to be delivered. The methods planned to achieve each objective or task should be discussed explicitly and in detail.

(4) Related Work. Describe significant activities directly related to the proposed effort, including any conducted by the PI, the proposer, consultants or others. Describe how these activities interface with the proposed project and discuss any planned coordination with outside sources. The proposal must persuade reviewers of the proposer's awareness of the state of the art in the specific topic. Describe previous work not directly related to the proposed effort but similar. Provide the following: (1) short description, (2) client for which work was performed (including individual to be contacted and phone number) and (3) date of completion.

(5) Relationship with Future Research or Research and Development.

   a) State the anticipated results of the proposed approach if the project is successful.
   b) Discuss the significance of the Phase II effort in providing a foundation for Phase III research and development or commercialization effort.

(6) Key Personnel. Identify key personnel who will be involved in the Phase II effort including information on directly related education and experience. A concise resume of the PI, including a list of relevant publications (if any), must be included. All resumes count toward the page limitation. Identify any foreign nationals you expect to be involved on this project.

(7) Foreign Citizens. Identify any foreign citizens or individuals holding dual citizenship expected

to be involved on this project as a direct employee, subcontractor, or consultant. For these individuals, please specify their country of origin, the type of visa or work permit under which they are performing and an explanation of their anticipated level of involvement on this project. Supplemental information provided in response to this paragraph will be protected in accordance with the Privacy Act (5 U.S.C. 552a), if applicable, and the Freedom of Information Act (5 U.S.C. 552(b)(6)).

(8) Facilities/Equipment. Describe available instrumentation and physical facilities necessary to carry out the Phase II effort. Items of equipment to be purchased (as detailed in the cost proposal) shall be justified under this section. Also state whether or not the facilities where the proposed work will be performed meet environmental laws and regulations of federal, state (name) and local Governments for, but not limited to, the following groupings: airborne emissions, waterborne effluents, external radiation levels, outdoor noise, solid and bulk waste disposal practices and handling and storage of toxic and hazardous materials.

(9) Subcontractors/Consultants. Involvement of a university or other subcontractors or consultants in the project may be appropriate. If such involvement is intended, it should be identified and described according to the Cost Breakdown Guidance. Please refer to section 4 of the DoD BAA for detailed eligibility requirements as it pertains to the use of subcontractors/consultants.

(10) Prior, Current or Pending Support of Similar Proposals or Awards. If a proposal submitted in response to this topic is substantially the same as another proposal that was funded, is now being funded, or is pending with another Federal Agency, or another or the same DoD Component, you must reveal this on the Proposal Cover Sheet and provide the following information:

a) Name and address of the Federal Agency(s) or DoD Component to which a proposal was submitted, will be submitted, or from which an award is expected or has been received.
b) Date of proposal submission or date of award.
c) Title of proposal.
d) Name and title of the PI for each proposal submitted or award received.
e) Title, number, and date of BAA(s) or announcement(s) under which the proposal was submitted, will be submitted, or under which award is expected or has been received.
f) If award was received, state contract number.
g) Specify the applicable topics for each proposal submitted or award received.

Note: If this does not apply, state in the proposal "No prior, current, or pending support for proposed work."

(11) Commercialization Strategy. Discuss key activities to achieve commercialization of the funded research into a product or non-R&D service with widespread commercial use – including private sector and/or military markets. Note that the commercialization strategy is separate from the Commercialization Report required in Volume 4. The strategy addresses how you propose to commercialize this research, while the Company Commercialization Report covers what you have done to commercialize the results of past Phase II awards.

The commercialization strategy must address the following questions:

a) What DoD Program and/or private sector requirement does the technology propose to support?
b) What customer base will the technology support, and what is the estimated market size?
c) What is the estimated cost and timeline to bring the technology to market to include

projected funding amount and associated sources?

d) What marketing strategy, activities, timeline, and resources will be used to enhance commercialization efforts?
e) Who are your competitors, and describe the value proposition and competitive advantage over the competition?

D. Content of the Cost Volume (Volume 3)

Complete the Cost Volume by using the on-line cost volume form on the Defense SBIR/STTR Innovation Portal (DSIP). Some items in the Cost Breakdown Guidance may not apply to the proposed project. If that is the case, there is no need to provide information on each and every item. What matters is that enough information be provided to allow us to understand how you plan to use the requested funds if a contract is awarded.

(1) List all key personnel by name as well as by number of hours dedicated to the project as direct labor.

(2) While special tooling and test equipment and material cost may be included, the inclusion of equipment and material will be carefully reviewed relative to need and appropriateness for the work proposed. The purchase of special tooling and test equipment must, in the opinion of the Component Contracting Officer, be advantageous to the Government and should be related directly to the specific topic. These may include such items as innovative instrumentation or automatic test equipment. Title to property furnished by the Government or acquired with Government funds will be vested with the DoD Component, unless it is determined that transfer of title to the contractor would be more cost effective than recovery of the equipment by the DoD Component.

(3) Cost for travel funds must be justified and related to the needs of the project.

(4) Cost sharing is permitted for proposals under this BAA; however, cost sharing is not required nor will it be an evaluation factor.

(5) A Phase II Option should be fully costed separately from the Base approach.

(6) All subcontractor costs and consultant costs must be detailed at the same level as prime contractor costs in regard to labor, travel, equipment, etc. Provide detailed substantiation of subcontractor costs in your cost proposal. Enter this information in the Explanatory Material section of the on-line cost proposal form.

If the proposal is selected for a potential award, you must be prepared to submit further documentation to the Component Contracting Officer to substantiate costs (e.g., an explanation of cost estimates for equipment, materials, and consultants or subcontractors). For more information about cost proposals and accounting standards, see http://www.dcaa.mil. Click on “Guidance” and then click on “Audit Process Overview Information for Contractors.”

E. Company Commercialization Report (Volume 4) Complete as specified in DoD SBIR/STTR BAA section 5.

METHOD OF SELECTION AND EVALUATION CRITERIA

Phase II proposals will be evaluated based on the criteria outlined in section 8 of the DoD 20.2 SBIR BAA Instructions.

OSD SBIR 20.2 Topic Index

OSD SBIR 20.2 Topic Description

OSD202- D001 TITLE: Microelectromechanical System (MEMS)/Coriolis Vibratory Gyroscope for Small Arms Fire Control Application

RT&L FOCUS AREA(S): Autonomy, Microelectronics (ME)
TECHNOLOGY AREA(S): Sensors, Electronics and Electronic Warfare, Weapons

OBJECTIVE: Develop a precise 2/3-axis MEMS gyroscope with low size/weight/cost for use in small-arms fire control devices designed for navigation/designation in high EMI and denied environments.

DESCRIPTION: Advanced weapon-mounted fire control requires accurate azimuth, cant and attitude information to calculate firing solutions. The combination of a hostile environment encountered by weapon mounted fire control devices making traditional navigation aids susceptible to failure and the emerging need to navigate and designate in denied environments formulates a need for a novel approach to this technical problem. The MEMS gyroscope should be well suited for the weapon-mounted environment: shock, power consumption and size must be appropriate for this intended use. The accuracy/drift should be sufficient that infrequent recalibration is required. Other than for initial and infrequent calibration, the sensor must operate without emission of any RF and in an environment with significant electromagnetic interference and/or metal housings. The sensor when in its operational configuration must be completely passive. The sensor should be ready to integrate into prototype fire control solutions and sized appropriately for this integration. The sensor must be capable of guiding navigation of the Warfighter to and from an objective and providing the azimuth and attitude (optionally cant) of the weapon system for a firing solution.

PHASE I: Given the direct to Phase II nature of this effort, a determination of Phase I equivalency will be made which will require proof the project is sufficiently mature to be funded at a Phase II level. A report detailing the Phase I equivalent efforts should be included. The technical approach should be well developed with preliminary functional prototyping at a minimum. Evidence of past successes in MEMS gyroscope development should be provided, ideally within the DOD development environment. The preliminary results obtained from functional prototyping should include drift, power requirements and size in addition to projected results in these parameters after the Phase II effort.

PHASE II: The primary deliverables for Phase II shall be:

1. A comprehensive report highlighting actual test results in both lab and operational environments. The report should address any barriers to full-rate production, potential manufacturing partners for full-rate production and design deficiencies w/ possible fixes to address any performance shortcomings
2. A test device for evaluation of the capabilities of the gyroscope. This device shall be internally powered with directionally-based outputs to show the gyroscope's capability in real time. Optionally, this device should integrate with a sample map and will be capable of passive navigation across a sample operational area using only the gyroscope w/ other included passive sensors, showing position on the map.
3. Up to ten (10) 2/3-axis gyroscopes capable of being integrated by the USG into prototype fire control devices.
4. A detailed Interface Control Document for the gyroscope that will assist the USG and/or a contractor in integrated the gyroscope into fire control devices.
5. A requirements document for the project initially, and a requirements review at the end of the effort.

PHASE III DUAL USE APPLICATIONS: This gyroscope will have tremendous commercial potential in end user devices, unmanned aerial systems and smart optical devices of all kinds. Additionally, this sensor has application in Augmented Reality/Virtual Reality systems where precision acceleration inputs are required. MEMS gyroscopes have potential to proliferate across consumer electronics to become standard equipment for increasing device orientation and movement accuracy. The DOD and commercial uses for the gyroscope are essentially identical with the only difference being the device integration. As a Phase III effort, there is potential to integrate the successful gyroscope into prototype fire control devices or create standalone navigational aids for integration into legacy systems. These efforts could be funded by either a Program Manager or Combat Capabilities Development Command entity.

REFERENCES:

1. Gyroscope Technology and Applications: A Review in the Industrial Perspective. https://www.mdpi.com/1424-8220/17/10/2284/pdf. 7 Oct 17.

KEYWORDS: Gyroscope, passive navigation, MEMS, Coriolis vibratory gyroscope, denied environment, fire control

TPOC-1: Devin Patterson
Email: devin.e.patterson2.civ@mail.mil

TPOC-2: Corey Hall
Email: corey.d.hall10.civ@mail.mil